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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/017,643	12/12/2001	Thomas C. Terwilliger	S-96,583	7287
35068	7590	09/24/2003		
UNIVERSITY OF CALIFORNIA LOS ALAMOS NATIONAL LABORATORY P.O. BOX 1663, MS A187 LOS ALAMOS, NM 87545			EXAMINER [REDACTED]	MARSCHEL, ARDIN H
			ART UNIT [REDACTED]	PAPER NUMBER 1631
DATE MAILED: 09/24/2003				

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>
	10/017,643	TERWILLIGER, THOMAS C.
Examiner	Art Unit	
Ardin Marschel	1631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

1)  Responsive to communication(s) filed on \_\_\_\_ .

2a)  This action is **FINAL**.                    2b)  This action is non-final.

3)  Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## **Disposition of Claims**

4)  Claim(s) 1-8 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5)  Claim(s) \_\_\_\_\_ is/are allowed.  
6)  Claim(s) 1-8 is/are rejected.  
7)  Claim(s) \_\_\_\_\_ is/are objected to.  
8)  Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

9)  The specification is objected to by the Examiner.

10)  The drawing(s) filed on \_\_\_\_\_ is/are: a)  accepted or b)  objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)  The proposed drawing correction filed on \_\_\_\_\_ is: a)  approved b)  disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)  The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

13)  Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a)  All b)  Some \* c)  None of:  
1.  Certified copies of the priority documents have been received.  
2.  Certified copies of the priority documents have been received in Application No. \_\_\_\_.  
3.  Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

14)  Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a)  The translation of the foreign language provisional application has been received.

15)  Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

1)  Notice of References Cited (PTO-892)  
2)  Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3)  Information Disclosure Statement(s) (PTO-1449) *Exhibit 3 Sheets*  
4)  Interview Summary (PTO-413) Paper No(s). \_\_\_\_.  
5)  Notice of Informal Patent Application (PTO-152)  
6)  Other: \_\_\_\_\_.

## **DETAILED ACTION**

### **NON-STATUTORY SUBJECT MATTER**

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-8 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Consideration of the "Computer-Related Inventions" section 2106 of the MPEP, part IV, revealed that the instant claims are directed to non-statutory subject matter because they manipulate concepts or convert data, but without resulting in any physical transformation outside of the computation or computer.

### **VAGUENESS AND INDEFINITENESS**

Claims 1-8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The instant invention is directed to improving an electron density map representing a crystal structure. Such structures are generally complex in nature involving many atoms in a molecule being mapped. As such the number of reflections obtained for the determination of a practical electron density map is generally numerous. In claim 1, part (a), the obtaining of a plurality of reflections is cited and then further processed in subsequent steps. A plurality of reflections is reasonably interpreted as being as few as two. The metes and bounds of what is meant by the

plurality limitations in the instant claims are vague and indefinite as to what number reasonably may be utilized for improving an electron density map. It may be reasonably interpreted that utilizing only two reflections will overly bias the improving of the electron density map as in the instant claims while the numerous other reflections may be reasonably required for a practical improved electron density map result. Clarification is requested as to what is meant by the plurality limitations in the instant claims via clearer claim wording as to what is actually performed to make a reasonable improved electron density map as a result of the instantly claimed method. It is noted in Subbiah (P/N 5,353,236) in column 8, lines 1-12, that a large number of data points, often over 10,000 are collected in such diffraction practice with 50-200 reflections being discussed for complete data. Claims dependent directly or indirectly from claim 1 are also included regarding this issue due to their dependence.

#### **PRIOR ART**

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-5 and 8 are rejected under 35 U.S.C. 102(b) and (e)(2) as being clearly anticipated by Subbiah (P/N 5,353,236).

Subbiah is directed to the crystallographic modeling of macromolecules as cited in the title and abstract with the construction of regions of units cells from diffraction patterns and Fourier amplitudes to calculate electron density distribution as is also the subject matter of the instant claims. In column 4, lines 22-42, the construction of a low-resolution envelope for the electron density distribution is disclosed. This low-resolution envelope for electron density is then improved by the phase thereof being utilized for the construction of new, higher resolution, envelopes in an comparative and iterative process of improvement of the electron density distribution as being modeled for the macromolecule. This improvement process is detailed further in column 19, line 48, through column 21, line 38, wherein the desired resolution is obtained. This resolution is the final set of crystallographic determined electron density distribution with the corresponding probable phases and minimum bias compared to the actual macromolecule structure as required in instant claim 1. The errors are also minimized for new envelopes also as a minimum bias as in instant claim 1 as described in column 21, lines 5-16. This column 21 citation also discloses the utilization of the reflections in the diffraction pattern as also instantly claimed. It is noted that each envelope of higher resolution is an estimated electron density distribution which is then compared with further phase refinement and reflection calculations to result in such practice as in the instant claims. Solvent regions and corresponding probability estimates are also described in the reference in column 20, lines 36-41, as required in instant claim 2. Particular structural motifs as in instant claims 4 and 5 are recognized in the map in the reference as disclosed in column 21, lines 34-39. Selection of reflections as well as

scaling factors which is reasonably a type of low weighting factor as in instant claim 8 is disclosed in column 14, line 57, through column 15, line 22. These improvement iterations and various steps anticipate the instant invention.

No claim is allowed.

Papers related to this application may be submitted to Technical Center 1600 by facsimile transmission. Papers should be faxed to Technical Center 1600 via the PTO Fax Center located in Crystal Mall 1. The faxing of such papers must conform with the notices published in the Official Gazette, 1096 OG 30 (November 15, 1988), 1156 OG 61 (November 16, 1993), and 1157 OG 94 (December 28, 1993)(See 37 CFR § 1.6(d)). The CM1 Fax Center number is either (703)308-4242 or (703)305-3014.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ardin Marschel, Ph.D., whose telephone number is (703)308-3894. The examiner can normally be reached on Monday-Friday from 8 A.M. to 4 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Woodward, Ph.D., can be reached on (703)308-4028.

Any inquiry of a general nature or relating to the status of this application should be directed to Legal Instrument Examiner, Tina Plunkett, whose telephone number is (703)305-3524 or to the Technical Center receptionist whose telephone number is (703) 308-0196.

September 19, 2003

  
ARDIN H. MARSCHEL  
PRIMARY EXAMINER